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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,120	02/27/2004	Koichiro Tanaka	0756-7259	4693

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EXAMINER	
LUU, CHUONG A	

ART UNIT	PAPER NUMBER
2892	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/787,120	TANAKA ET AL.	
	Examiner	Art Unit	
	Chuong A. Luu	2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/19/2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,8,10-13 and 15-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,8,10-13 and 15-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/9/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 7-8, 10-13 and 15-24 have been considered but are moot in view of the new ground(s) of rejection.

PRIOR ART REJECTIONS

Statutory Basis

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The Rejections

Claims 7-8, 10 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyairi (U.S. 6,803,296).

Miyairi discloses a semiconductor device with

(7); (8) shaping a first laser beam having a wavelength not longer than that of visible light into an elongated beam on a surface to be irradiated, wherein said laser beam is a harmonic wave of a solid laser;

irradiating the surface with the elongated beam wherein an irradiation area of the elongated beam has at least a first portion and a second portion, said first portion having a lower energy density than the second portion;

irradiating the surface with a second laser beam concurrently with the elongated beam, said second laser beam having a fundamental wave emitted from a solid laser, in such a manner that an irradiation area of the second laser beam overlaps at least the first portion of the irradiation area of the beam while moving the surface relatively to the beam and the second laser beam in a first direction (see column 10, line 35 through column 12, line 16. Figures 1-5);

(10) wherein each of the first laser beam and the second laser beam is emitted from one selected from the group consisting of a YVO_4 laser (see column 11, line 53);

(22) wherein each of the first laser beam and the second laser beam is emitted from a continuous wave solid laser (see column 10, line 60).

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PRIOR ART REJECTIONS

Statutory Basis

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The Rejections

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyairi (U.S. 6,803,296).

Miyairi teaches everything above except for disclosing the substrate transparent to the first laser beam having a thickness d, and wherein an incidence angle Ø of the first laser beam to the surface to be irradiated satisfies an inequality Ø ≥arctan (W/2d), when a major axis of the elongated beam or a minor axis of the elongated beam is assumed to have a length of W. However, the substrate transparent to the first laser beam having a thickness d, and wherein an incidence angle Ø of the first laser beam to the surface to be irradiated satisfies an inequality Ø ≥arctan (W/2d), when a major axis of the elongated beam or a minor axis of the elongated beam is assumed to have a length of W are considered to be obvious. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teaching of Miyairi since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, and it also has been held that where the general conditions of a claim are disclosed in the prior ad, discovering the optimum or workable ranges involves only routine skill in the art and it is noted that the applicant does not disclose criticality in the ranges claimed. In re Leshin, 125 USPQ 416 and In re Aller, 105 USPQ 233 (see MPEP 2144.05).

PRIOR ART REJECTIONS

Statutory Basis

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The Rejections

Claims 12-13, 15, 17-21 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyairi (U.S. 6,803,296) in view of Taketomi et al. (U.S. 6,806,498).

Miyairi discloses a semiconductor device with

(12); (13); (18); (19) forming a non-single crystalline semiconductor film over a substrate;

shaping a first laser beam emitted from a first laser oscillator into an elongated beam on a surface to be irradiated wherein the first laser beam has a wavelength not longer than that of visible light, wherein said laser beam is a of a solid laser;

irradiating the non-single crystalline semiconductor film with the beam wherein an irradiation area of the elongated beam has at least a first portion and a second portion, said first portion having a lower energy density than the second portion, wherein a portion of the non-single crystalline semiconductor film irradiated with the first laser beam;

irradiating at least said portion of the non-single crystalline semiconductor film with a second laser beam emitted from a second laser oscillator, said second laser beam having a fundamental wave emitted from a solid laser, wherein the irradiation of said portion of the non-single crystalline semiconductor film with the second laser beam is performed when said portion is in a molten state due to the irradiation of said first laser beam, and an irradiation area of the second laser beam overlaps at least the first portion of the irradiation area of the elongated beam;

moving the substrate relatively to the elongated beam and the second laser beam in a first direction, thereby, forming a crystal grain region in the non-single crystalline semiconductor film;

moving the substrate in a second direction relatively to the elongated beam and the second laser beam (see column 10, line 35 through column 12, line 16. Figures 1-5);

(15); (20) wherein each of the first laser beam and the second laser beam is emitted from one selected from the group consisting of a YVO_4 laser (see column 11, line 53);

(23); (24) wherein each of the first laser beam and the second laser beam is emitted from a continuous wave solid laser (see column 10, line 60).

Miyairi teaches everything above except for with the first laser beam is melted and a substrate transparent to the first laser beam having a thickness d, and wherein an incidence angle Ø of the first laser beam to the surface to be irradiated satisfies an inequality Ø ≥arctan (W/2d), when a major axis of the elongated beam or a minor axis of

the elongated beam is assumed to have a length of W. However, Taketomi discloses a semiconductor thin film with **(12); (13); (18); (19)….** with the first laser beam is melted (see column 6, line 50 through column 7, line 30); Even through, Miyairi and Taketomi do not explicitly describe the substrate transparent to the first laser beam having a thickness d, and wherein an incidence angle Ø of the first laser beam to the surface to be irradiated satisfies an inequality Ø ≥arctan (W/2d), when a major axis of the elongated beam or a minor axis of the elongated beam is assumed to have a length of W. However, the substrate transparent to the first laser beam having a thickness d, and wherein an incidence angle Ø of the first laser beam to the surface to be irradiated satisfies an inequality Ø ≥arctan (W/2d), when a major axis of the elongated beam or a minor axis of the elongated beam is assumed to have a length of W are considered to be obvious. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teaching of Miyairi (accordance with the teaching of Taketomi) since it has been held that where the general conditions of a claim are disclosed in the prior ad, discovering the optimum or workable ranges involves only routine skill in the art and it is noted that the applicant does not disclose criticality in the ranges claimed. In re Aller, 105 USPQ 233 (see MPEP 2144.05). Additionally, since Miyairi and Taketomi are both from the same field of endeavor (semiconductors), the purpose disclosed by Taketomi would have been recognized in the pertinent art of Miyairi.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyairi (U.S. 6,803,296) in view of Taketomi et al. (U.S. 6,806,498) and further in view of Ishihara et al. (U.S. 5,891,764).

Miyairi and Taketomi teach the above outlined features except for wherein the first direction and the second direction are orthogonal to each other. Furthermore, Ishihara discloses a laser processing apparatus with **(16)** wherein the first direction and the second direction are orthogonal to each other (see column 13, lines 1-3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Miyairi, Taketomi and Ishihara to adjust first direction and the second direction are orthogonal as disclosed in Ishihara (see column 13, lines 1-3). Additionally, since Miyairi, Taketomi and Ishihara are from the same field of endeavor (semiconductors), the purpose disclosed by Ishihara would have been recognized in the pertinent arts of Miyairi and Taketomi.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A. Luu whose telephone number is (571) 272-1902. The examiner can normally be reached on M-F (6:30-3:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao X. Le can be reached on (571) 272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chuong A Luu/
Primary Examiner, Art Unit 2892
June 16, 2009